Remarks

Claims 1, 2, 4-13, 18, 19, 21-23, 27 and 28 are pending in the subject application. By this Amendment, claim 1 is amended, and claims 7, 8, 10, 18, 19, 21-23, 27, and 28 are canceled. No new matter is introduced. Support for the claim amendment can be found throughout the original specification (see, for example; page 7, lines 4-22; and original claims 8 and 10). Upon entry of these amendments, claims 1, 2, 4-6, 9, and 11-13 will be before the Examiner. Favorable consideration of the pending claims is respectfully requested.

Claims 18, 19, and 21-23 have been rejected under 35 U.S.C. §102(b) as being anticipated by Jones (U.S. Patent No. 3,916,465: Figures 1-3 and U.S. Patent No. 3,800,602). By this Amendment Applicants have canceled claims 18, 19, and 21-23, thereby rendering moot this rejection.

Claims 1, 2, 4, 6-13, 27, and 28 have been rejected under 35 U.S.C. §103(a) as being obvious over Jones (U.S. Patent No. 3,916,465: Figures 1-3 or U.S. Patent No. 3,800,602) in view of Lehmann *et al.* (IDS: Sensor Proceedings II, 2001, 487-492). Applicants respectfully request reconsideration.

Initially, Applicants stress once again that the claimed invention is directed to a miniaturized gas chromatograph and this recitation should be given its full and proper patentable weight. Though the claims do not explicitly recite a particular dimension or size, this is nevertheless defined by the term "miniaturized." As discussed in the Declaration of Uwe Lehmann filed May 4, 2010 (hereinafter referred to as "the Lehmann Declaration"), the term "miniaturized gas chromatograph" has a known meaning in the art and excludes conventional structures and techniques (see, e.g., paragraph 5 of the Lehmann Declaration). "If the claim preamble is 'necessary to give life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165-66 (Fed. Cir. 1999); *Jansen v. Rexall Sundown, Inc.*, 342 F.3d 1329, 1333, 68 USPQ2d 1154, 1158 (Fed. Cir. 2003); MPEP §2111.02. Also, the determination of whether preamble recitations are structural limitations or mere statements of purpose or use "can be resolved only on review of the entirety of the [record] to gain an understanding of what the inventors actually invented and intended to encompass by the claim." *Corning Glass Works,* 868 F.2d at 1257, 9 USPQ2d at 1966; MPEP §2111.02. In this case, as established by the Lehmann Declaration and the subject specification, the term "miniaturized gas chromatograph" is well known to convey certain structural/dimensional

characteristics to those of ordinary skill in the art; thus, it does give life, meaning, and vitality to the claim; and therefore should be given patentable weight.

Moreover, as discussed in the Amendment filed May 4, 2010, the Jones references are directed to conventional gas chromatographs. The Lehmann Declaration, particularly paragraphs 4-6, explains the specific, well-recognized differences between conventional gas chromatographs and miniaturized gas chromatographs, and further explains why any functional or manufacturing characteristics cannot be transferred by the ordinary skilled artisan from one type of gas chromatograph to the other. Thus, the Jones references are directed to completely different classes of devices, using completely different materials, and completely different manufacturing techniques than those of the subject invention or of the Lehmann *et al.* reference.

One skilled in the art of Jones is not the same as the ordinary skilled artisan in the field of the subject invention. Contrary to what is asserted at pages 6-7 of the Action, it is not obvious to one having ordinary skill in the art to merely reduce the size of the Jones devices. In cannot be disputed that one of ordinary skill in Jones' art does not have the technical grasp to produce the miniaturized gas chromatographs of the claimed invention. A change in size may well be within the level of ordinary skill in the art if it is only a mere downsizing of elements using the same materials and manufacturing techniques taught in the cited reference. However, the invention part of the subject application has elements that are so miniaturized, neither the materials nor the manufacturing techniques used for conventional gas chromatographs could possibly be used for the miniaturized gas chromatographs claimed herein. Miniaturized gas chromatographs are not merely conventional devices of conventional materials, only shrunken; rather, they are of vastly different materials and manufactured in vastly different ways. Conventional gas chromatographs are manufactured using conventional techniques such as casting, bending, welding, soldering, milling, and the like, while miniaturized gas chromatographs use manufacturing techniques known from integrated circuit production (e.g. micromachined or micro-mechanical system techniques such as wet etching, dry etching, electro discharge machining, and photolithographic techniques). As is readily apparent, these manufacturing techniques are of significant difference from the conventional techniques used for conventional gas chromatographs.

In fact, the Jones references are so different as to constitute non-analogous art which the ordinary artisan would find neither useful nor suggestive when contemplating the subject invention.

The secondary reference, Lehmann *et al.*, fails to cure these deficiencies and one would not be motivated to combine references teaching the manufacture of conventional gas chromatographs with those teaching miniaturized gas chromatographs.

Further, the claimed invention includes a plasma polymerized layer of plastic on the side of a sheet. The Action asserts that that "plasma polymerized" is only a method of manufacture and does not impart any structural limitations to the claim. However, this assertion fails to take into account the fact that a plasma polymerized layer by definition results in specific characteristics of the product manufactured by the process; the plasma polymerized layer will be an extremely thin layer to a degree not possibly contemplated or suggested by the Jones references. These inherent structural distinctions must be accorded adequate weight. Though no specific dimensions are recited in claim 1, an ordinary skilled artisan would understand that a plasma polymerized layer in a miniaturized gas chromatograph would necessarily be extremely thin (on the micro scale) and is quite different than the macro-scale clad of Jones.

Also, it appears that the Action does not differentiate between the terms "circuit board" and "silicon chip." The Action states at page 4 that Lehmann *et al.* disclose providing a gas chromatography module on a silicon chip; however, this is not necessarily the same thing as a circuit board. A circuit board can be made of several materials, including laminates comprising thin copper foil as a conducting layer. Though a silicon chip could be used to produce the chromatographic column, part of the injector, and the detector, it is not necessarily a circuit board. Neither the Jones documents nor the Lehmann *et al.* reference discloses a circuit board or a specific arrangement of components made from a silicon chip placed on such a circuit board.

Moreover, the claimed invention requires "an electronic control and evaluation unit placed on the circuit board." The Action states at page 5 that a control and evaluation unit will have to be present on the Lehmann *et al.* device. Applicants respectfully disagree. A number of different solutions would be available to the skilled person to provide a control and evaluation unit in the Lehmann *et al.* device. For example, it could be incorporated into a computer which may also be used to store and display results and, in that case, it would be positioned a distance from the gas chromatograph itself. Alternatively, a control and evaluation unit could be provided in a separate housing. In any event, it is not implicit from the Lehmann *et al.* reference that a control and evaluation unit would necessarily be arranged on a circuit board which further comprises an injector,

a column, and a detector. Instead, this is a specific embodiment with advantages recognized by the subject inventors, including that it allows for a compact and miniaturized design of the whole gas chromatograph and those electronic components required for evaluating the data and controlling the analytical process. Thus, the combination of cited references fails to teach or suggest an electronic control and evaluation unit placed on a circuit board, as required by the claimed invention.

In addition, Applicants submit that the combination of cited references does not teach a plurality of recesses in the circuit board. Though the Action cites Figure 4 of Lehmann *et al.* for allegedly disclosing this feature, Figure 4 only shows a trench in a silicon chip and does not disclose a circuit board, let alone a plurality of recesses in such a circuit board. In the subject invention, the injector, the gas chromatographic column, and the detector are arranged in separate recesses in the circuit board and connected to the circuit board by small-dimensioned electrical wires for data transfer and small-dimensioned capillaries for gas flow. This arrangement allows the conduction of heat from these components to the electronic components of the circuit board to be significantly reduced allowing for precise temperature control of the injector, the column, and the detector, while also protecting the electronic components on the circuit board from heat generated in the course of the analytic process. This particular embodiment and the advantages resulting therefrom are clearly not even contemplated in the combination of cited references.

As discussed above, a skilled artisan would not have had a reason to turn to the Jones references for any teaching related to miniaturized gas chromatographs, nor would a skilled person have combined the teachings of Lehmann *et al.* with those of Jones. Even assuming, for the sake of argument, that these references were combined, certain important aspects of the claimed invention are still not disclosed or suggested. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103 (a) based on Jones in view of Lehmann *et al.*

Claim 5 has been rejected under 35 U.S.C. §103 (a) as being obvious over Jones (U.S. Patent No. 3,916,465: Figures 1-3 or U.S. Patent No. 3,800,602) in view of Lehmann *et al.* (IDS: Sensor Proceedings II, 2001, 487-492), and further in view of Lehmann *et al.* (IDS: Micro Total Analysis system, 2000, 167-170). Applicants respectfully request reconsideration.

The deficiencies of the Jones references have been set forth above. They are directed to a completely different class of devices than those disclosed in the Lehmann *et al.* (2001) and Lehmann *et al.* (2000) secondary and tertiary references. One of ordinary skill in the art would not look to

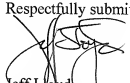
combine these teachings because the methods of manufacture used are completely different, to the point where they amount to non-analogous art. It is unreasonable to assert that an ordinary artisan would look first to Jones, then choose to modify any of the Jones elements by miniaturizing them a thousand-fold or more and making them of silicon. Moreover, even assuming, for the sake of argument, that these references were combined, certain important aspects of the claimed invention would still not be disclosed or suggested. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 5 under 35 U.S.C. §103 (a).

In view of the foregoing remarks and amendments to the claims, Applicants believe that the claims as currently pending are in condition for allowance, and such action is respectfully requested.

Applicants invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16 or 1.17 as required by this paper to Deposit Account 19-0065.

Respectfully submitted,



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